

EXHIBIT A

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CABLE DUCT COUPLER WITH LOCKING CLIPBACKGROUND OF THE INVENTION1. Field of Invention

5 The invention relates to a coupler for coupling cable duct sections. More particularly, the invention relates to a coupler that allows quick assembly using a locking retention clip without the need for tools.

2. Description of Related Art

10 Raceway and duct systems have become very popular in recent years to route, protect and conceal data, voice, video, fiber-optic and/or power cabling. Such systems allow custom installation and can be provided within walls or more preferably provided on external surfaces, allowing ready access for reconfiguration, repair, or installation of additional equipment. Such systems can include various sections of duct or raceway, including straight sections, 90 degree corner fittings, 45
15 degree corner fittings, T fittings, four-way intersections (X) fittings, and the like, which are affixed together by way of a duct coupler.

SUMMARY OF THE INVENTION

While commercial duct systems exist, there is a need for such a system to be more easily configured.

20 There also is a need for an improved duct coupler that can easily and reliably couple discrete sections of duct elements, such as troughs or fittings, with minimal or no tools.

There further is a need for such a system and coupler that allows relatively easy disassembly.

25 The invention has been made to satisfy the above needs and objects and provides a cable raceway duct coupler for a cable duct system. The system includes a cable raceway duct coupler that joins various discrete cable raceway duct sections, which can be either troughs or fittings, and a retention clip that locks and retains the duct sections against the coupler. The cable raceway duct is readily customizable for placement within building walls or provided as a surface mount system to route,
30 protect and conceal data, voice, video, fiber-optic and/or power cabling.

In particular, the invention relates to a cable duct coupler comprising an inner wall shaped to define a cable-receiving channel therebetween, the inner wall having a predefined axial length between forward and rearward edges; a support rib outwardly extending from the inner wall, the support rib being substantially centrally disposed between the forward and rearward edges of the inner wall, the support rib including at least one clip mount; an axially extending outer wall formed on the support rib, the axially extending outer wall being outwardly spaced from the inner wall by a predefined distance to define a duct section receiving space therebetween; and at least one removable retention clip matable with the clip mount through an open space provided in the outer wall, said retention clip having arms that extend into the duct section receiving space, wherein upon insertion of duct sections into the duct section receiving space, the at least one retention clip biases the duct sections against the inner wall to retain the duct sections together.

The cable duct coupler may have an axially extending outer wall formed from a plurality of discrete outer wall portions to form the open space therebetween. A retention clip may be provided at one or more of the open spaces.

The removable retention clip is movable between an insert position in which the arms extend into the duct section receiving space to allow coupling and a detach position in which the arms no longer extend into the duct section receiving space to allow disassembly of the discrete duct sections.

The retention clip is formed of a resilient material and is preferably bent to form arms that are angled towards the support rib of the duct coupler. This resilient material is preferably metal. The arms may be sharpened or serrated at an edge thereof to increase retention of the duct section with the coupler.

With this invention, an attachment end of a duct element, such as a trough or fitting, is able to be relatively easily slid in one direction into the duct receiving space and constrained by the inner and outer walls. However, the retention clips provide a retention force acting on the attachment ends of the duct elements that resist undesired disassembly of the duct element from the coupler in an opposite direction. However, disassembly, when necessary, can be achieved easily by removal of the retention clip, such as by unscrewing.

The invention also relates to a cable duct system including the cable duct coupler and one or more cable duct sections, which can be fittings or troughs. In such

a system, the retention clips are preferably pre-installed at least partially into the clip mounts of the cable duct coupler.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and further objects, features and advantages of the present invention will become apparent from the following description of preferred embodiments with reference to the accompanying drawings, wherein:

Fig. 1 is a perspective view of a cable raceway duct coupler according to the invention coupling two discrete sections of cable raceway duct;

Fig. 2 is a perspective view of the cable raceway duct coupler of Fig. 1;

Fig. 3 is an end view of the cable raceway duct coupler of Fig. 1;

Fig. 4 is an exploded view of a cable raceway duct system according to a second embodiment of the invention;

Fig. 5 is a cross-sectional view of a duct retention barb member affixed to the duct coupler used to bias and retain the discrete sections of cable raceway duct within the coupler; and

Figs. 6-13 show various cable duct fittings that can also be affixed to each other or to a cable raceway duct by the cable raceway duct coupler.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

A first embodiment of a cable raceway duct system according to the invention will be described with reference to Figs. 1-3. The system includes a cable raceway duct coupler 100 that joins various discrete cable raceway duct sections 200, which can take the form of straight raceway trough sections as shown or various cable raceway duct fittings as shown in Figs. 6-13, and a retention clip 300 that retains and locks the duct sections against the coupler 100.

As better shown in Figs. 2-3, the coupler 100 is shaped to correspond to and mate with duct sections 200. In the exemplary embodiments shown, the duct section and duct coupler are generally U-shaped. However, the invention is not limited to such shapes and may be formed from other shapes and configurations, i.e., circular, multi-sided, polygonal, etc., to form a cable receiving channel therebetween. The coupler can be formed from any rigid or semi-rigid material, such as metal or plastic. A preferred material is a molded or extruded plastic, such as acrylonitrile butadiene styrene (ABS).

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The coupler 100 has an inner wall consisting of two side walls 110 and a bottom wall 120, which are preferably integral and continuous. A support rib 130 outwardly extends from the U-shaped inner wall and is substantially centrally disposed between forward and rearward edges 112, 114, respectively, of the inner wall. An axially extending outer wall 140 is formed on the support rib 130. Outer

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